PROJECT LEVEL TRAFFIC MANAGEMENT PLAN
I-5: SW Iowa Street Viaduct Br. #08197 Sec.
M.P. 298.09 – M.P. 298.39
Multnomah County
Key #14949

Looking at the Iowa Street Viaduct on I-5

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1 INTRODUCTION

1.1 PURPOSE AND BACKGROUND

The purpose of the "I-5: SW Iowa Street Viaduct Br. #08197 Sec." project is to replace the I-5 Iowa Street viaduct structures. The decks of the current structures are deteriorated and in need of major repair. The structures also need to be brought up to current roadway and seismic standards. The replacement structure will be widened on both sides to accommodate upgraded shoulders and median. In addition, it will require the removal of a large existing gravity retaining wall that holds a landslide and the construction of new retaining walls. Due to the nature of the bridge replacement and retaining wall work, weekend single lane closures in both directions of I-5 will be required. The weekend single lane closures will occur between 8:00 p.m. Friday and 5:30 a.m. Monday for a maximum of 15 weekends.

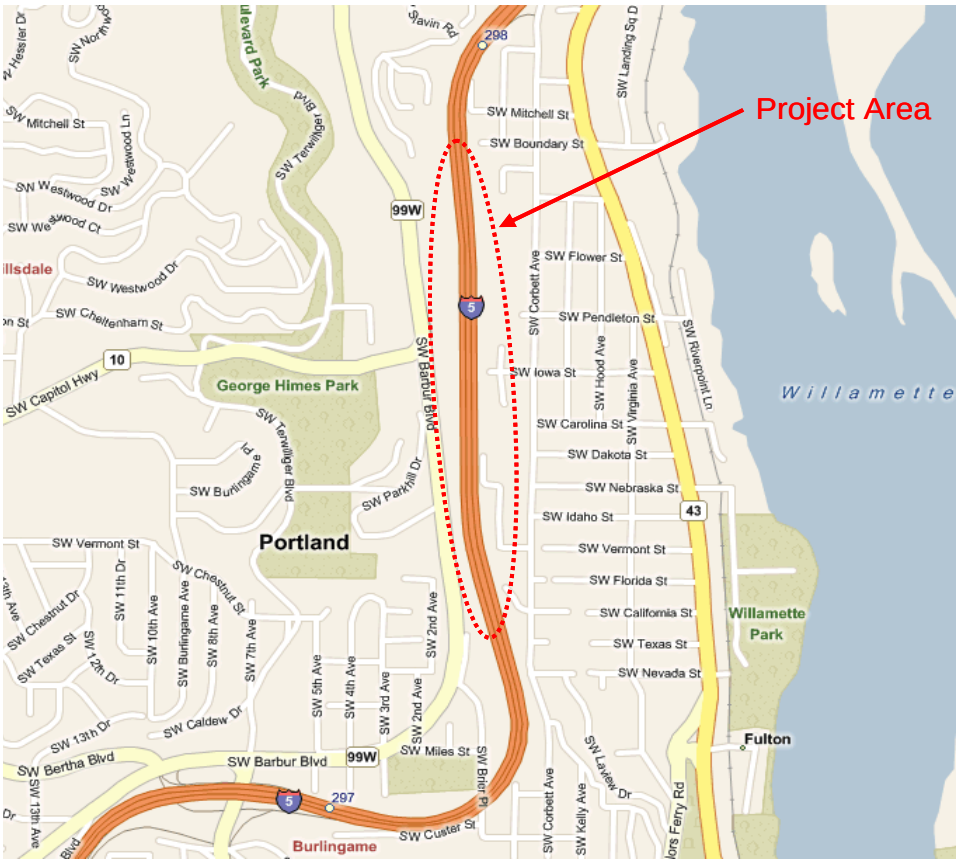
1.2 REPORT DESCRIPTION

This report is the Project Level Traffic Management Plan (TMP), which primarily focuses on safety analysis, traffic volume data analysis, construction staging, work zone lane restrictions, and traffic management and operation strategies.

1.3 STUDY AREA BOUNDARIES

The project is on I-5 at the SW Iowa Street Viaduct Bridge, with the project limits spanning from M.P. 298.09 to M.P. 298.39. A vicinity map is provided in Figure 1.

Figure 1: Vicinity Map



1.4 TMP GOALS

The primary purpose of the TMP is to address the construction-related impacts of this project in a cost-effective and timely manner with minimal interference to the traveling public. Goals of this Project-Level TMP include the following:

- To communicate the project construction footprint within the limits of Interstate 5.
- To communicate any possible freight mobility construction delay factors.
- To communicate what elements will be included in the project to mitigate for any anticipated disruptions to travelers and freight without compromising public or worker safety.

To accomplish these goals, the Project-Level TMP incorporates the following elements:

- Definition of study area boundaries
- Safety analysis
- Integration of traffic data analysis
- Factors impacting construction staging
- Potential mobility issues
- Construction staging
- Work zone lane restrictions
- Traffic management and operation strategies
- Incident management plan
- Mobility communication plan

2 SAFETY ANALYSIS

2.1 CRASH HISTORY

An analysis of the reported crashes on I-5 mainline in the project section was performed for the five-year period from 2003 through 2007. Table 1 provides a summary of the crashes by type and severity.

Table 1: Crash Summary

I-5: M.P. 298.09 – M.P. 298.39 5-Year (2003-2007)							
Direction	Crash Type		Crash Severity				
	Rear-End	Sideswipe Overtaking	Fatal	Injury A* (Major)	Injury B* (Intermediate)	Injury C* (Minor)	Property Damage Only
Northbound	14	4	0	1	2	2	13
Southbound	5	2	0	0	0	2	5
Both Directions	19	6	0	1	2	4	18

* Injury A – Major (bleeding, broken bones, etc.)
* Injury B – Intermediate (bruises, swelling, etc.)
* Injury C – Minor (complaints of pain)

As shown in the table above, there were a total of 25 reported crashes in both directions on I-5 mainline over the course of five years. The breakdown of crashes by direction shows that the northbound direction has more crashes in comparison to the southbound direction. The

crashes were of two types, rear-end and sideswipe overtaking, of which the majority were attributed to the congestion in the corridor.

In assessing crash severity, there were: one major injury crash; two intermediate injury crashes; four minor injury crashes; and 18 property-damage-only crashes. There were no fatal crashes within the project section.

Figures 2A and 2B below are graphical representations of the crashes by location in the northbound and southbound directions, respectively. The x-axis represents the milepoint and the y-axis represents the number of crashes that occurred at the specific milepoint. It should be noted that the higher number of crashes occurred at milepoints 298.17 and 298.25 in the northbound direction.

Figure 2A: I-5 Northbound Crashes by Location

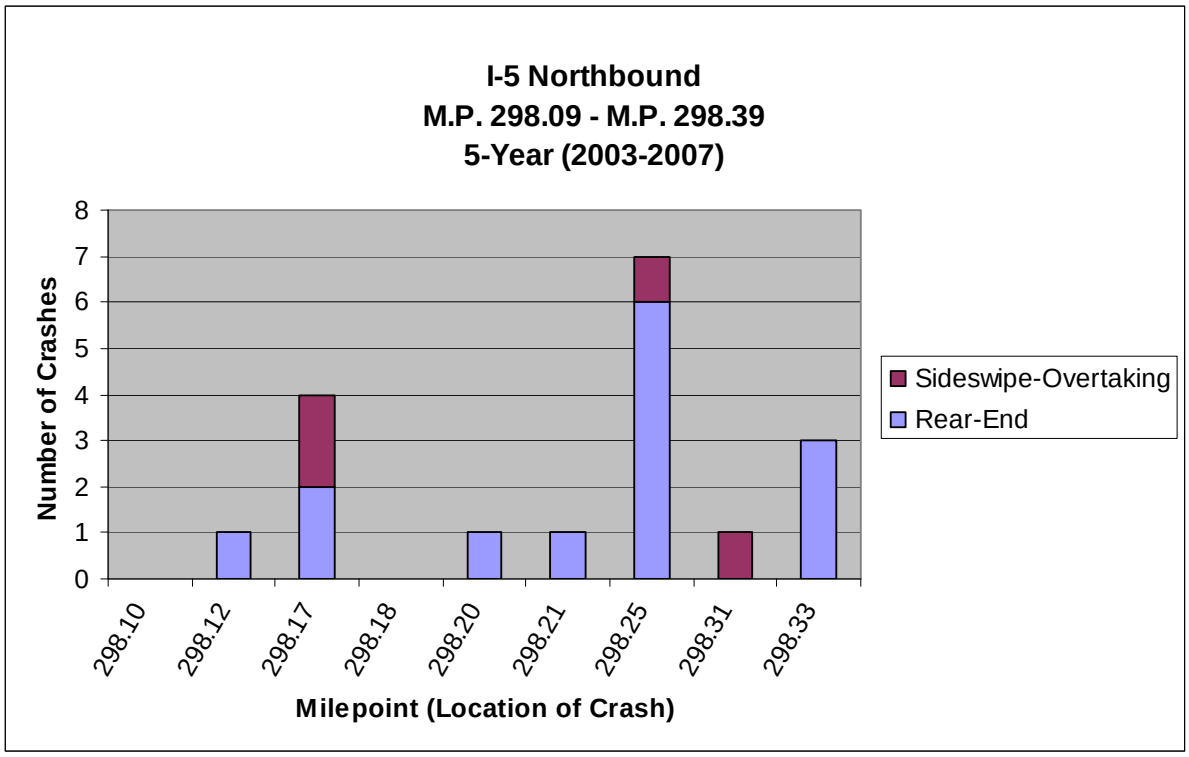
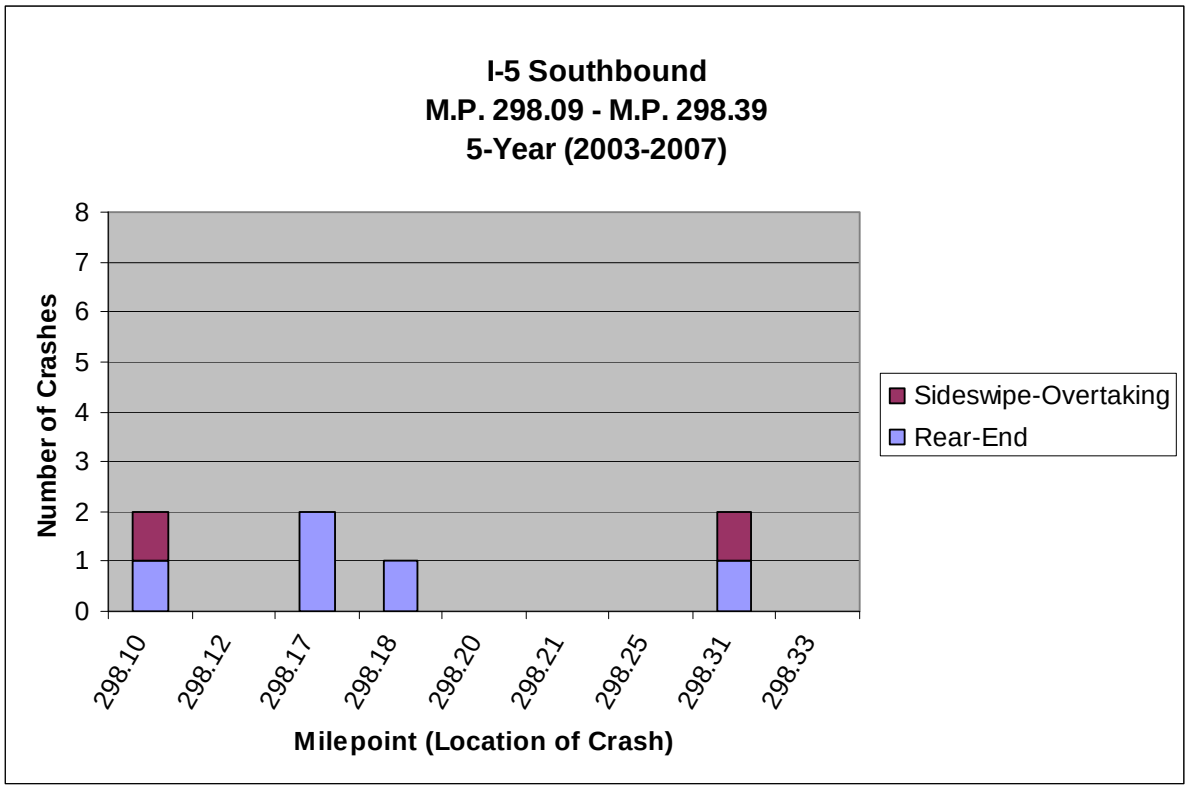


Figure 2B: I-5 Southbound Crashes by Location



The computed crash rate for the project section is 0.32 crash per million vehicle miles traveled. This is lower than the 2006 statewide average crash rate of 0.48 crash per million vehicle miles traveled on similar Urban Interstate Freeways.

2.2 SPIS RATINGS

The Safety Priority Index System (SPIS) is a method developed by ODOT for identifying high crash locations on state highways based on crash data over a three-year period and is comprised of three components: crash frequency, crash rate, and crash severity. According to the 2008 SPIS list, there are no top 10% SPIS sites within the project section. The 2008 SPIS top 10% cut-off value is 44.27 and the highest SPIS value within the project section is 19.52.

3 ROADWAY CHARACTERISTICS

3.1 TRANSPORTATION FACILITY

According to the 1999 Oregon Highway Plan, I-5 is an Interstate Freeway and a designated Freight Route and Truck Route on the National Highway System. The highway is functionally classified as an "Urban Principal Arterial-Interstate" in the ODOT Highway Design Manual.

3.2 DAILY TRAFFIC AND TRUCK PERCENTAGE

The existing average daily traffic volumes from the 2007 Transportation Volume Tables indicate that I-5 carries approximately 145,000 vehicles. The projected average daily traffic volumes for the design year 2031 is 191,000 vehicles. Trucks account for 9% of the traffic on I-5 within the project section.

3.3 POSTED SPEED

The current posted speed limit on I-5 in the project section is 55 MPH. The posted speed limit changes to 50 MPH approximately 200 feet south of the southern project limit.

4 DATA ANALYSIS

4.1 TRAFFIC VOLUMES

The traffic volumes on I-5 were analyzed to identify traffic flow on a typical weekday, Saturday and Sunday in August. The counts were taken from the Iowa Street Automatic Traffic Recorder #26-016. Figures 3A and 3B show a plot of the hourly volumes for I-5 northbound and southbound traffic, respectively.

Figure 3A: I-5 at SW Iowa Street Viaduct
Traffic Flow for 24-Hour Period

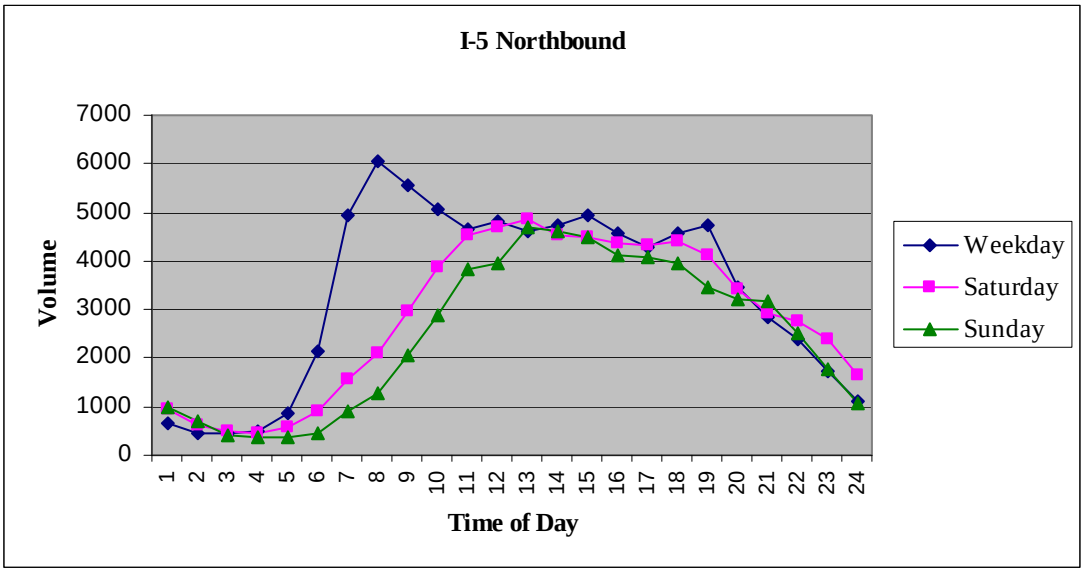
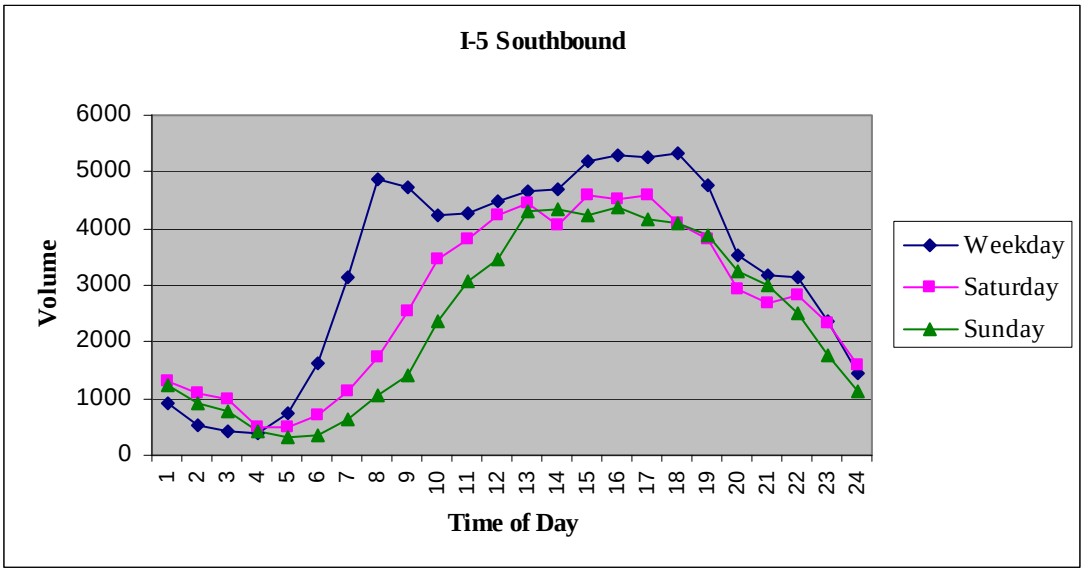


Figure 3B: I-5 at SW Iowa Street Viaduct
Traffic Flow for 24-Hour Period



As shown in Figures 3A and 3B above, the peak weekday traffic volumes for I-5 are approximately 6,000 vehicles during the a.m. in the northbound direction and 5,300 vehicles during the p.m. in the southbound direction. The Saturday traffic pattern is similar to Sunday traffic, both with a peak hour volume of approximately 4,300 to 4,850 vehicles during the midday in the northbound and southbound directions. In terms of daily volumes, traffic on Saturday and Sunday are about 83% and 73% of the weekday's, respectively.

In order to alleviate congestion on I-5 due to the planned weekend single lane closures during construction, it is anticipated that there will be significant traffic diversion to OR99W, which is the most viable alternate route. As such, traffic volumes on OR99W were analyzed to identify the traffic flow on a typical weekday, Saturday, and Sunday. Traffic counts were collected from June 18-22, 2008 on OR99W south of SW Bertha Blvd. near M.P. 4.30. Figures 4A and 4B show a plot of the hourly volumes for OR99W northbound and southbound traffic, respectively.

Figure 4A: OR99W South of SW Bertha Blvd.
Traffic Flow for 24-Hour Period

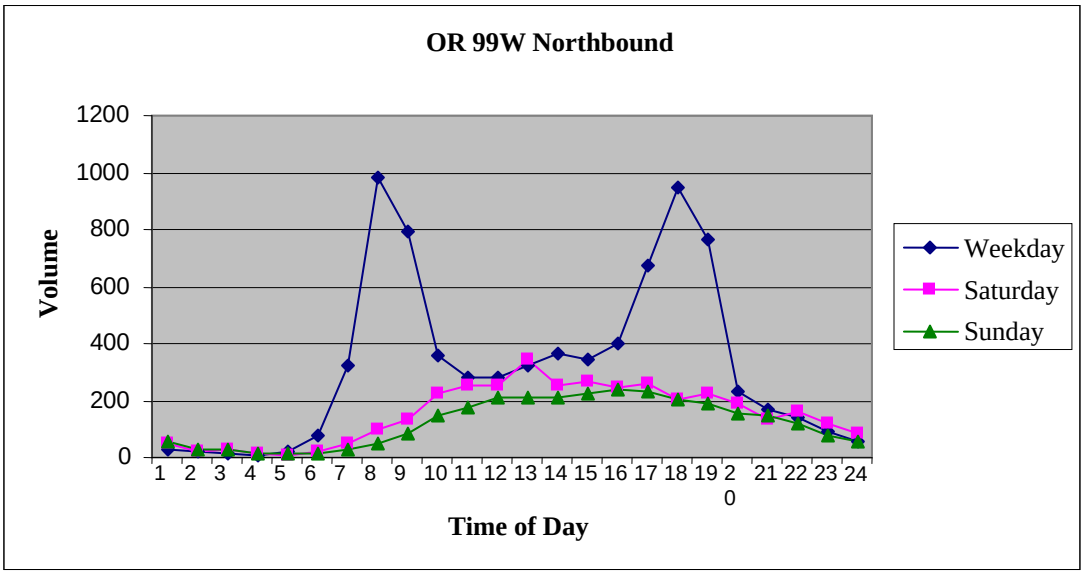
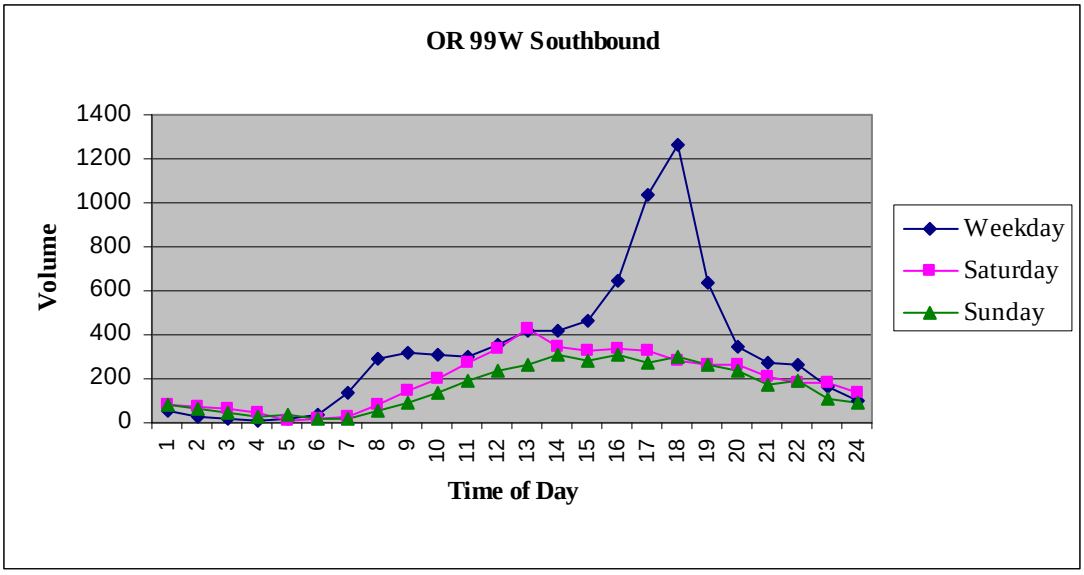


Figure 4B: OR99W South of SW Bertha Blvd.
Traffic Flow for 24-Hour Period



The capacity on OR99W is estimated to be at least 1800 vph - 2000 vph in each direction. As shown in Figures 4A and 4B, OR99W has excess capacity throughout the day on the weekends to accommodate traffic diversion from I-5.

A coordinated public outreach program to inform the public of the project and encourage motorists to use alternate routes such as OR99W or plan trips to avoid peak travel time is critical to manage congestion during the project construction. In addition, the I-5 northbound on-ramp from S.W. Terwilliger Blvd./S.W. Bertha Blvd. and I-5 southbound on-ramp from S.W. Hood Avenue (OR43) should be closed during the planned weekend single lane

closures to minimize traffic impacts. It should be noted that one lane in each direction on I-5 was closed for approximately eleven weekends to facilitate the construction of the "I-5: Marquam Bridge – Capitol Highway Section (key# 09364)" project in summer 2005. The S.W. Terwilliger Blvd./Bertha Blvd. northbound on-ramp and S.W. Hood Avenue southbound on-ramp were closed during the weekend closures to alleviate congestion.

4.2 TRAVEL TIME

Geotechnical exploration work was conducted during the midday on Saturday, April 12, 2008 for this project. The work took place on the outside shoulder of I-5 northbound, which required the "C" lane (outside lane) be closed for staging, leaving two lanes for northbound traffic on I-5. The distance or length of closure spanned approximately 3,200 feet. OR99W served as a diversion route for the I-5 northbound traffic. Through the public outreach program and utilization of the variable message sign on OR99W, drivers traveling on OR99W northbound were advised to continue on OR99W rather than taking the I-5 northbound on-ramp. For drivers on OR99W northbound who were destined for I-5 northbound but then chose to stay on the OR99W diverted route, the next available opportunity to access I-5 would be via the Morrison Bridge on-ramp.

Travel time data was collected on I-5 northbound and OR99W northbound during the lane closure period. Four travel time runs were conducted on I-5 northbound and two runs were conducted on OR99W northbound. The results are summarized in Table 2 below. Based on the four travel time runs on I-5 northbound, the length between the start of lane closure and the back of traffic queue ranged from 1.5 miles to 2.5 miles. The corresponding travel time through the queue varied from 6.75 minutes to 13.3 minutes. Based on the two travel time runs on OR99W northbound, it was observed that OR99W traffic was flowing smoothly with no unusual congestion or back-up. This was due to signal timing adjustments made on OR99W northbound, which coordinated the signal system to facilitate the progression of the northbound through movements. The signal timing adjustments were based on implementing the signal timings typically used for the morning peak period on weekdays. It should be noted that the travel times on I-5 and OR99W were fairly equal.

Table 2: Travel Time During Single Lane Closure on I-5 Northbound

Saturday, 4/12/2008					
A. I-5 NB (OR217 On-ramp to Morrison Br.) 8.49 miles	**12:20pm**	**12:53pm**	**2:33pm**	**3:05pm**	**Average**
Travel Time (min:sec)	16:16	19:54	15:45	14:04	16:29
Length of Queue (mi)	1.90	2.55	1.68	1.55	1.92
Travel Time through Queue (min:sec)	9:03	13:29	8:43	6:46	9:30
B. OR99W NB (OR217 On-ramp to Morrison Br.) 8.23 miles	**1:30pm**	**3:45pm**			**Average**
Travel Time (min:sec)	17:43	16:22			17:02

For comparison purpose, travel time data was also collected on the same I-5 northbound and OR99W northbound segments during a typical Saturday (May 10, 2008) midday with no lane closures. Four travel time runs were conducted on I-5 northbound and two runs were conducted on OR99W northbound. The results are provided in Table 3 below. The average

travel time on I-5 northbound from the OR217 on-ramp to the Morrison Bridge was 9 minutes and 21 seconds. The average travel time on OR99W northbound from OR 217 to the Morrison Bridge was 18 minutes.

Table 3: Travel Time without Lane Closure on I-5 Northbound

Saturday, 5/10/2008					
A. I-5 NB (OR217 On-ramp to Morrison Br.) 8.49 miles	**12:17pm**	**12:45pm**	**1:49pm**	**2:15pm**	**Average**
Travel Time (min:sec)	9:17	9:21	9:29	9:19	9:21
B. OR99W NB (OR217 On-ramp to Morrison Br.) 8.23 miles	**1:13pm**	**2:43pm**			**Average**
Travel Time (min:sec)	16:40	19:21			18:00*

* No signal timing adjustments made

4.3 CONSTRUCTION DELAY

Based on the travel time study, it was concluded that the estimated delay was approximately seven minutes during the single lane closure on I-5 northbound on weekends. Similar delay is expected for closing a lane on I-5 southbound on weekends.

In addition to the planned weekend single lane closures, there will be night time lane closures on weeknights for other construction activities. The impact of night time lane closures is minimal due to the low volumes on I-5 at night. The delay is estimated to be two to three minutes.

5 FACTORS IMPACTING CONSTRUCTION STAGING

Construction of the project is scheduled to begin in 2010 and will continue on a year-round schedule. The following is an overview of the factors that have potential impacts on construction staging.

5.1 PROPOSED IMPROVEMENTS AND IMPACTS TO TRAFFIC FLOW

As described in Section 1.1, the proposed improvements primarily include replacing the I-5 Iowa Street viaduct structures and construction of new retaining walls. Due to the nature of the bridge replacement and retaining wall work, weekend single lane closures in both directions of I-5 will be required. The weekend single lane closures will occur between 8:00 p.m. Friday and 5:30 a.m. Monday for a maximum of 15 weekends. Weeknight lane closures will occur to allow for other construction activities.

5.2 EXISTING RESTRICTIONS

Every effort will be made to minimize lane closures on I-5 during the high traffic volume daytime hours, limiting lane closures to night times to the greatest extent possible.

5.3 ALTERNATE ROUTES

OR99W serves as the main alternate route for traffic during the weekend single lane closures. Other routes such as I-205, OR217 and OR43 can be utilized as possible alternate routes as well.

5.4 ENVIRONMENTAL RESTRICTIONS

This project will impact a high number of trees. Tree cutting must be performed prior to March 15, 2010.

5.5 HOLIDAY, EVENT AND SEASONAL RESTRICTIONS

Holidays and seasonal events may impact traffic. The major holidays are included as standard restrictions in the *2008 Oregon Standard Specifications for Construction* Manual. Some of the local and seasonal events that may create an increased burden on the project area include the annual Portland Rose Festival and Providence Bridge Pedal.

5.6 CONSTRUCTION NOISE REGULATIONS

A construction noise variance is required for this project and has been obtained from the City of Portland through the Region Public Affairs Unit.

6 POTENTIAL MOBILITY ISSUES

6.1 TRAFFIC MOBILITY DURING CONSTRUCTION

- Freight Traffic: I-5 is used by freight traffic for both local and long haul trips. The project area must maintain accessibility to I-5 for over-dimensional loads at all times. Special consideration will be necessary for freight accessibility through the project area.

- Emergency Access: Emergency vehicle access will be provided at all times.

6.2 CONSIDERATION OF OVERSIZED VEHICLES

As part of the National Highway System, I-5 is a designated Freight Route and a Truck Route. Therefore, it will be essential that I-5 be able to accommodate large trucks during construction. Motor Carrier Transportation Division (MCTD) requires the following schedule for notification of size or weight restrictions:

- Available roadway width remaining open 22 feet or greater – no advance notification to MCTD is required.

- Available roadway width (one lane one way, barrier-to-barrier) less than 22 feet – requires 28-day advance notification to MCTD.

- Available roadway width less than 19 feet – requires mobility exception.

- Available roadway width is measured across the road from any fixed object to the face of a guard rail or barrier. The Contractor must notify MCTD, Region Mobility Coordinator and the Engineer, in writing using Form#734-2357. The notification should include the date of the lane restrictions, times they will be in effect, the approximate milepost location, and direction of traffic affected.

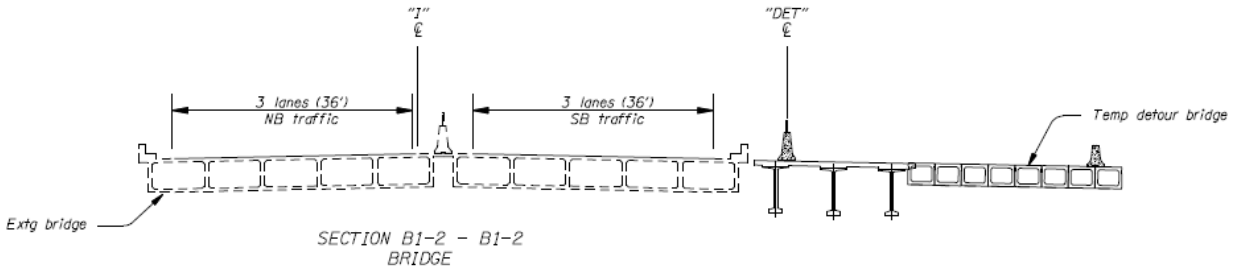
7 CONSTRUCTION STAGING

Traffic volume, speed, and mobility are the primary factors in considering staging design on this project. All 6 mainline lanes and adequate shoulder width need to remain open during peak traffic hours throughout the course of construction. Lane closures should be allowed only during non-peak hours (night time), and during limited weekend day time hours for construction activities that require more than one work-shift to complete. Full freeway closure shall be avoided at all times. For a few construction activities (beam swings, rock or concrete blasting, or overhead sign installation) that require full lane closure, contractor may use the Rolling Slowdown Method (RSM). This method allows full lane closure of up to 20 minutes for one or both I-5 directions. RSM should be permitted at night after 11:00pm for rock blasting, and after mid-night for beam swings and overhead sign structure installation. The procedures for the RSM are included in the contract special provisions. Night time lane restrictions for one-lane or two-lane closures in each direction of I-5 for safe work zone are provided under the project special provisions section 00220.40.

With the above mentioned traffic constraints and restrictions, and to keep traffic flow during construction, a temporary detour bridge and a temporary detour road will be required. Construction and traffic staging for the I-5 Iowa Street Viaduct replacement could be achieved under 4 major stages as follows.

7.1 STAGE I

Figure 5A: STAGE I – Section View



[*Stage I - looking south, ahead on line*]

This stage is critical to subsequent stages. The primary purpose of this stage is to construct a temporary detour bridge and a detour roadway, while constructing all retaining walls west of I-5. Due to the need for temporary barriers to be moved nightly for the work zone, zipper (movable) barriers will be used. The primary construction items on this stage:

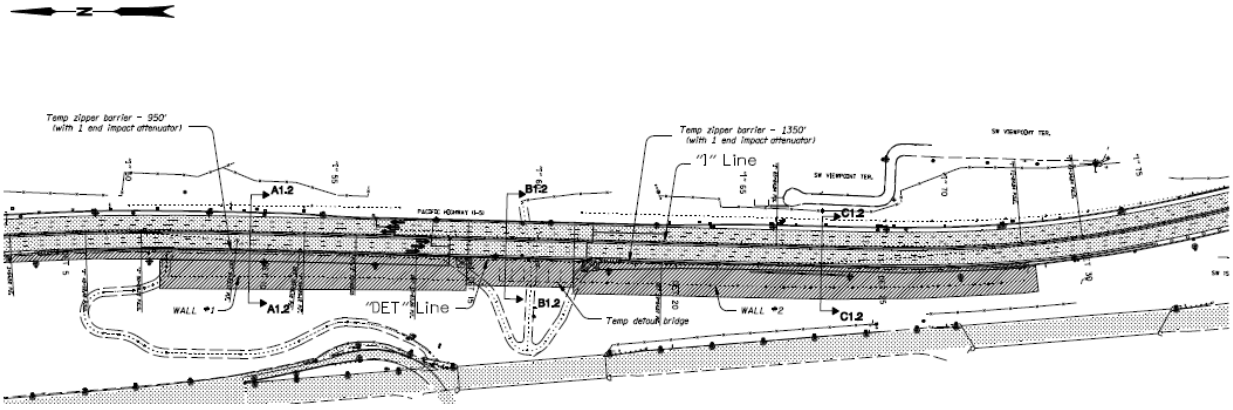
Phase 1:

- Three temporary access roads

Phase 2:

- Removal of existing buttress wall (possible blasting)
- Temporary detour bridge and detour road
- Temporary illumination
- Retaining wall 1
- Retaining wall 2
- Iowa Bridge stage I
- Bridge end panels, road approaches
- Permanent road widening
- Drainage crossing under I-5 near north end of wall 6

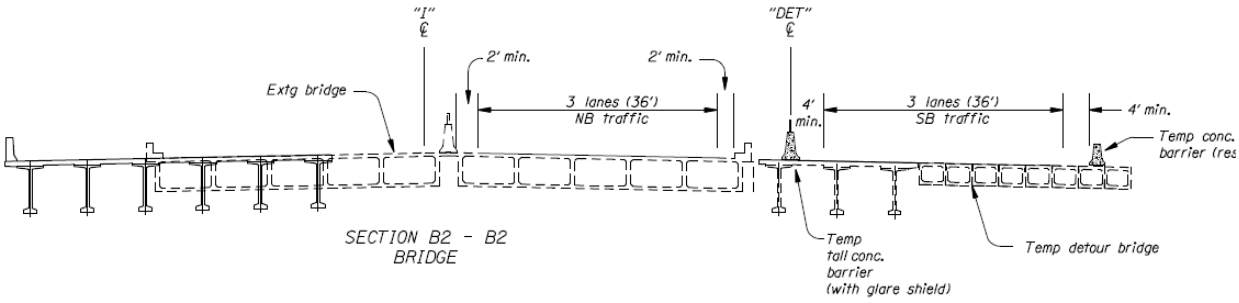
Figure 5B: STAGE I – Plan View



Traffic during Stage I will stay on the existing lanes. Access to work zone at grade level can be from I-5 SB barrier opening available at north of the bridge or from SW Barbur Blvd via temporary access road that is built in phase 1 of this stage. Substantial materials produced by retaining wall excavation will be hauled out either via I-5 SB, south of the bridge or via SW Babur Blvd. If the material out-hauled is via the I-5 SB, one lane of the I-5 SB will need to be closed to allow for safe truck acceleration before merging onto mainstream traffic. Consequently, hauling material via I-5 SB shall be done during non-peak traffic (night time).

7.2 STAGE II

Figure 6A: STAGE II – Section View

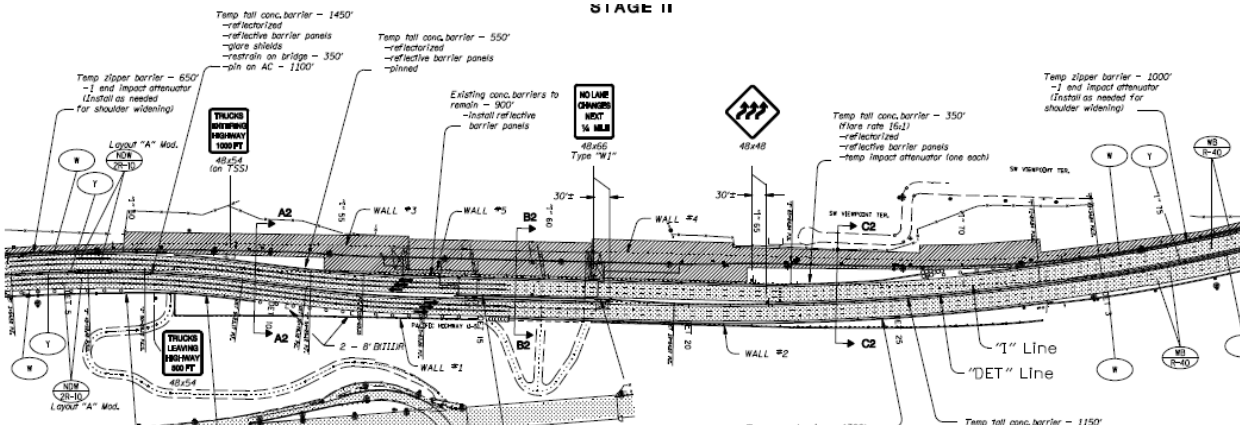


[*Stage II - looking south, ahead on line*]

Once the temporary detour bridge and Stage I - Iowa Bridge are built, traffic on I-5 can be shifted to the west freeing up work zone for Stage II, mostly on the east side of the existing I-5. The primary work items in this stage include:

- Partial demolition of existing Iowa Bridge
- Iowa Bridge Stage II
- Bridge end panels, road approaches
- Wall 4A, and 4B
- Wall 3
- Wall 6

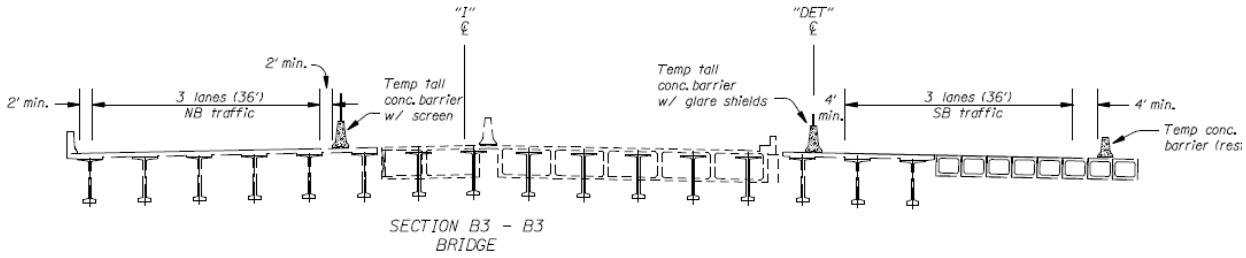
Figure 6B: STAGE II – Plan View



While I-5 SB traffic is shifted to the temporary detour bridge, traffic on I-5 NB is shifted to the old I-5 SB lanes. With traffic diversion, temporary illumination should be in place. Access to work zone at roadway grade is from the I-5 NB barrier openings, which are available on each end of the bridge. Zipper barriers could be used nightly to close the NB lanes for extra work room to construct walls and for shoulder widening. Contractor can also access work areas by going under the bridge from the southbound lanes barrier opening located between the south end of Wall 1 and the bridge rail. An alternate/secondary access needed to construct walls 4A and 4B can also be from SW View Point Terrace.

7.3 STAGE III

Figure 7A: STAGE III – Section View

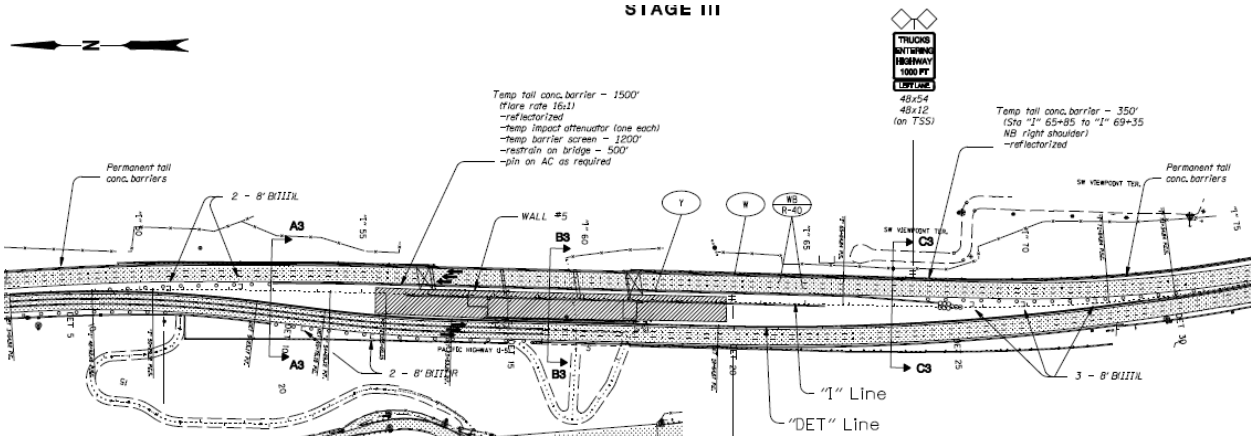


[*Stage III - looking south, ahead on line*]

In this stage, I-5 NB traffic is shifted to the east, onto the newly built bridge and roadway constructed from Stage II. I-5 SB traffic is to remain on temporary bridge as in Stage II. This scheme creates a work zone in between the two I-5 directions for the completion of the remaining Iowa Bridge structure.

Ingress and egress of the work zone at the roadway grade level are available from the NB direction – fast lane. This can be a safety concern for slowing construction vehicles. Work zone signing needs to be enhanced to help mitigate this condition. Access from SB direction to work area is still available at the south end of Wall 1 (same location as in Stage II).

Figure 7B: STAGE III – Plan View

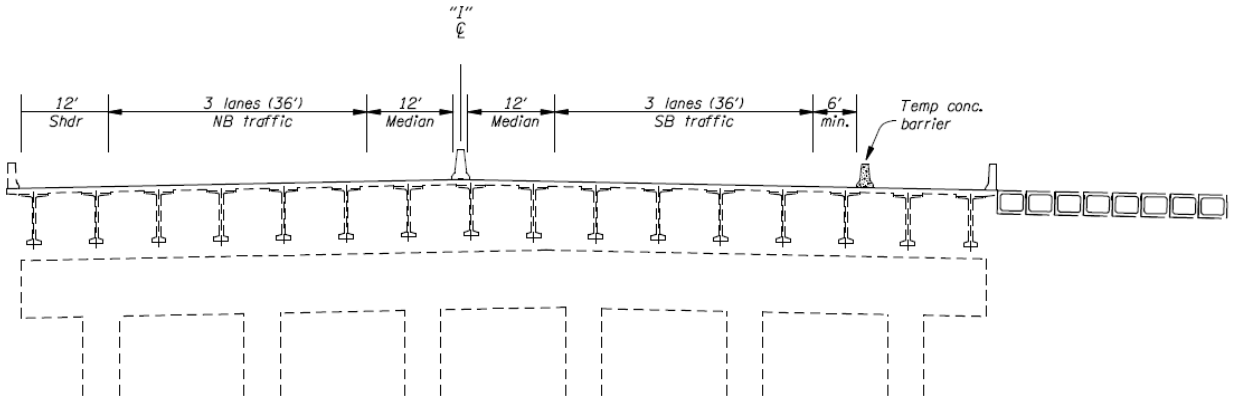


The primary construction items in this stage include:

- Demolishing the remainder of the existing bridge
- Iowa Bridge Stage III
- Wall 5
- Bridge end panels, road approaches

7.4 STAGE IV

Figure 8A: STAGE IV – Section View

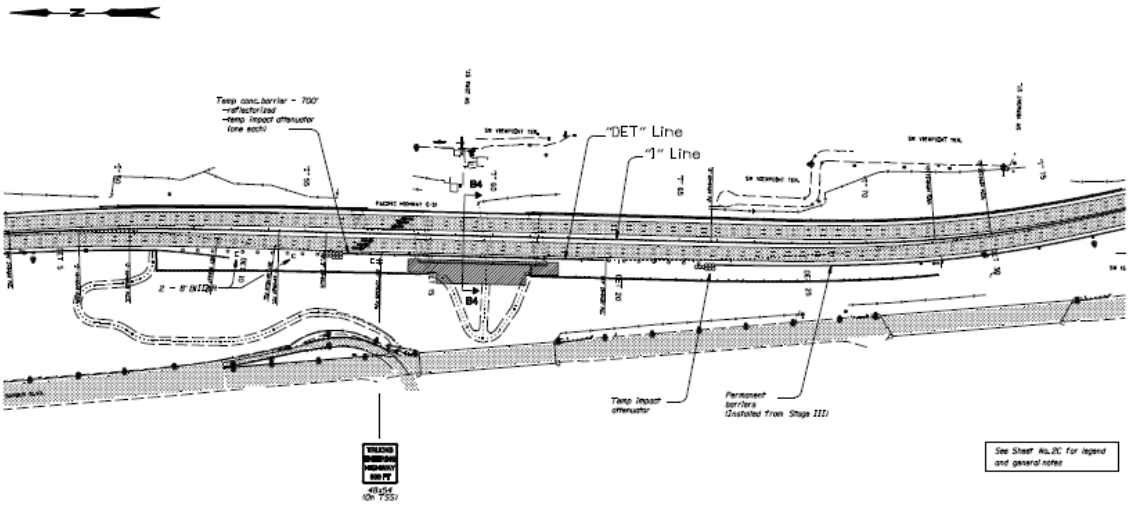


[*Stage IV - looking south, ahead on line*]

Both I-5 NB and SB directions will be placed on its final configuration. The temporary detour bridge will be removed. The primary work items in this stage include:

- Bridge rail (west side)
- Final lift paving
- Permanent concrete barriers
- Demolishing temporary detour bridge
- Removing temporary road
- Landscaping
- Striping and signing

Figure 8B: STAGE IV – Plan View



7.5 OTHER CONSIDERATIONS

Trail under the bridge:
For safety of the trail users, the trail under the Iowa Bridge will be closed. Trail users will be rerouted to cross I-5 at SW Terwilliger Blvd. Detour signing will be provided.

Hauling of excess excavation materials
If hauling materials out of the work area is via I-5, contractor will be restricted to do this work only at night when I-5 lanes can be closed to create an acceleration lane for heavily loaded trucks. Day time hauling can be done by exiting via Barbur Blvd, via one of the temporary access roads.

Beam swing and crane setting:
In addition to RSM, contractor will be allowed to close two I-5 lanes in each direction during non-peak traffic (night time) to achieve this task.

Cost of Temporary Traffic Control:
For DAP, the cost on biddable work items associated with temporary traffic control is estimated at 1.5% to 2% of the cost of all other construction items excluding TP & DT bid items. This cost should account for temporary traffic devices, flaggers, traffic control supervisors, and temporary illumination that will be required during temporary traffic diversions. The cost for temporary detour bridge and detour road are extras.

8 WORK ZONE LANE RESTRICTIONS

00220.40(e) Lane Restrictions - Replace the paragraph that begins "Do not close any…" with the following paragraph:

Do not close any traffic lanes and remove all barricades and objects from the roadway during the following periods:

Replace subsections (1) and (2) with the following:

Pacific Highway (I-5) Northbound and Southbound

No single lane closures are allowed:

- between 5:30 a.m. and 8:00 p.m., Monday - Friday
- between 9:00 a.m. and 8:00 p.m., Saturday
- between 10:00 a.m. and 8:00 p.m., Sunday

No two lane closures are allowed:

- between 5:00 a.m. and 10:00 p.m., Monday – Thursday
- between 5:00 a.m. and 11:00 p.m., Friday
- between 7:00 a.m. and 11:00 p.m., Saturday

- between 9:00 a.m. and 10:00 p.m., Sunday

Pacific Highway West (OR99W) Northbound

No single lane closures are allowed:

- between 6:00 a.m. and 9:00 a.m. and between 4:00 p.m. and 7:00 p.m., Monday - Friday

Pacific Highway West (OR99W) Southbound

No single lane closures are allowed:

- between 4:00 p.m. and 7:00 p.m., Monday - Friday

Pacific Highway (I-5) Northbound and Southbound Ramps

Do not close the on-ramps or off-ramps during the times listed below:

- between 5:30 a.m. and 10:00 p.m., Monday – Sunday

(4) Special Events - Add the following to the end of this subsection:

The following special events will occur during this Project:

- Rose Festival Grand Floral Parade - June 12, 2010, June 11, 2011, and June 9, 2012
- Providence Bridge Pedal – August 8, 2010, August 14, 2011, and August 12, 2012

Add the following subsection(s):

00220.40(f) Limited Duration Weekend Lane Closure - The Contractor will be permitted to close one travel lane on Pacific Highway (I-5) in the southbound direction, northbound direction, or both directions simultaneously between 8:00 p.m. Friday and 5:30 a.m. Monday for a maximum of 15 individual weekends.

Notify the Engineer a minimum of two weeks before implementing the weekend lane closures.

All lanes on OR99W must remain open during the weekend lane closures on I-5. In addition, the I-5 northbound on-ramp from S.W. Terwilliger Blvd./S.W. Bertha Blvd. and I-5 southbound on-ramp from S.W. Hood Avenue are allowed to be closed during the weekend lane closures.

00220.40(g) Road Closure Using Rolling Slowdown Method (RSM) - The Contractor will be permitted to use a RSM for slowing traffic and closing all travel lanes on the Pacific Highway (I-5) for periods not to exceed 20 minutes while installing sign supports or overhead signs over the highway travel lanes, installing bridge girders, and blasting. This work will be allowed only during the following time periods:

- between 11:00 p.m. and midnight, Monday – Sunday, for blasting
- between midnight and 5:00 a.m., Monday – Sunday, for erecting bridge girders, sign supports and overhead signs

9 TRAFFIC MANAGEMENT AND OPERATION STRATEGIES

In order to minimize construction impacts on traffic flow in the I-5 corridor and promote work zone safety, the traffic management and operation strategies shown in Table 4 should be considered to support the construction activities of the project. A detailed description of each strategy is provided in the sections following Table 4.

Table 4: Traffic Management and Operation Strategies

X	**Public Information and Outreach**	X	**Incident Management**
			Call Boxes
X	**Motorist Information/ITS**		Construction Zone Enhanced Enforcement Program
	Dynamic Message Signs (DMS)	X	Corridor Management Team (COMET)
X	Variable Message Sign (VMS)		Dedicated Service Patrol
X	Portable Changeable Message Sign (PCMS)	X	Traffic Surveillances Stations/(CCTV)
X	Ground Mounted Signs	X	Cell Phones
	Commercial Traffic Radio	X	Traffic Control Officers
	Highway Advisory Radio (fixed and mobile)	X	Full-Time Traffic Control Supervisor
X	Planned Lane Closure Website		Helicopter (Media)
X	TripCheck – ODOT's ITS Website	X	Variable Message Sign (VMS)
	Radar Speed Message Signs	X	Towing Vehicles
X	**Construction Strategies**	X	**Demand Management**
	Incentive/Disincentive Provisions		HOV Lanes/Ramps
X	Ramp Metering		Park-and-Ride Lots
	Lane Rental		Parking Management/Pricing
X	Off Peak/Night/Weekend/Off Seasonal Work		Rideshare Incentives
	Temporary Pavement (runaround)		Rideshare Marketing
X	Temporary Pavement (widening)		Transit Incentives
X	Temporary Striping		Transit Service Improvements
X	Planned Lane/Ramp Closures		Train or Light-Rail Incentives
X	Project Phasing		Variable Work Hours
	Temporary Traffic Signals		Telecommute
	Total Facility Closure		Shuttle Service Incentives
X	Pilot Car	X	Temporary Lanes or Shoulder Use
X	Temporary Traffic Screens		Freeway to Freeway Connector Closures
	Truck Traffic/Permit Restrictions		
	Reversible Lanes	X	**Alternate Route Strategies**
X	Extended Weekend Closures	X	Ramp Closures
	Reduced Speed Zones		Street Improvements
X	Coordination with Adjacent Construction		Temporary Lanes or Shoulder Use
X	Rolling Slowdown Method (RSM)	X	Signal Timing Adjustments on OR99W
X	Full-Time Traffic Control Supervisor		
	Traffic Control Improvements		
(X) Consideration for Project			

9.1 PUBLIC INFORMATION AND OUTREACH

Public information and outreach is beneficial for maintaining public support for projects as well as encouraging changes in travel behavior during the project construction. Subsequently, keeping the public aware of delays as they occur may encourage motorists to use alternate routes or plan trips to avoid peak travel time. This, in turn will help to manage congestion throughout the project timeline.

9.2 MOTORIST INFORMATION/ITS

Providing motorists with real-time information helps to notify drivers of upcoming work zones and may alleviate congestion and delay. The information below identifies strategies that could be implemented in this project to provide motorist information.

- **Variable Message Sign (VMS):** Variable message signs are electronic signs that can display changing message. There are a number of variable message signs located in advance of the project site. VMS should be used to warn drivers of any incidences or traffic delay within the construction area so that they can choose to detour to an alternate route if needed.

- **Portable Changeable Message Signs (PCMS):** PCMS is a portable electronic sign that can display changeable messages. They are useful when informing drivers of upcoming construction periods and warning drivers of construction activities as needed.

- **Ground Mounted Signs:** Typically installed at the endpoints of work zones informing motorists of road construction and the possibility of delay. Ground mounted signage would also be needed to alert motorists of the availability of Highway Advisory Radio information if/when provided.

- **Planned Lane Closure Website:** Information could be relayed either through a stand-alone website or as a link on the ODOT website or local television station and newspaper websites (e.g. KATU, KOIN, KGW, The Oregonian).

- **TripCheck (ODOT's ITS Website):** TripCheck allows motorists to retrieve real time information and weather conditions via the Internet. In addition to the Internet, motorists may also call 511 to receive this same information.

9.3 CONSTRUCTION STRATEGIES

Useful construction strategies as they pertain to this project are described below.

- **Ramp Metering:** Normally a two-phase (red and green, no yellow) traffic light used together with a signal controller, ramp meters regulate the flow of traffic entering freeways according to the current traffic conditions – thereby reducing congestion on freeways by reducing demand and by breaking up platoons of cars.

- **Off-Peak/Off-Seasonal/Night/Weekend Work:** As much as possible, temporary lane or ramp closures should be undertaken during the off-peak or night time to avoid excessive congestion. *The weekend 1-lane closures on I-5 will be limited to a maximum of 15 weekends.*

- **Temporary Pavement (widening):** Temporary pavement will be built to facilitate the shifting of travel lanes throughout the various stages of construction.

- **Temporary Striping:** When required, temporary striping on the travel lanes will be provided to direct and control traffic in areas where lane shifts are necessary.

- **Planned Lane or Ramp Closures:** Temporary lane or ramp closures, when required, will be limited to the off-peak and night time hours.

- **Project Phasing:** Maintaining the existing travel lane configuration in each direction during construction will create less delay for motorists. Although phasing requires a longer construction period, it does minimize out of direction travel.

- **Pilot Car:** Pilot cars may be used during lane closures to facilitate and control the traffic flow to minimize delay.

- **Temporary Traffic Screens:** Traffic screens help prevent driver distractions in work zones, which can help to keep traffic moving and enhance safety. Screens may be mounted on the top of temporary traffic barriers to discourage gawking and reduce headlight glare.

- **Extended Weekend Closures:** Weekend closures are advantageous because of greatly reduced disruption of AM and PM peak commuters.

- **Coordination with Adjacent Construction:** The following are ODOT STIP projects that may have traffic impact during construction of the "I-5: SW Iowa Street Viaduct Br. #08197 Sec." project:

  - "I-5: Victory Blvd. – Lombard St., Key #12076", a modernization project to add a third lane southbound between Victory Blvd. and Columbia Blvd.
  - "I-5: Holladay - Marquam, Key #15140", a pavement preservation project in combination with a bridge project to repair bridge joints and provide a deck overlay.
  - "I-5: Wilsonville Rd. – Willamette River Bridge, Key #12837", a pavement preservation project.
  - "SW Gibbs St. Pedestrian Bridge Over I-5 (Portland), Key #14065", a City of Portland project to construct of a pedestrian bridge over I-5 at SW Gibbs Street.

- **Rolling Slowdown Method (RSM):** This method allows for slowing traffic and closing of all travel lanes in one or both directions for up to 20 minutes. RSM is performed by using one pilot car for each lane to be slowed. The pilot cars shall enter the roadway, form a moving blockade, and reduce traffic speeds to create a gap in

traffic to accomplish the work without completely stopping traffic. One additional pilot car is used as a chase vehicle to follow the last free-flowing vehicle ahead of the blockade.

- **Full-Time Traffic Control Supervisor:** A more rapid response time to incidents is possible when a full-time traffic control officer and/or a supervisor are on site to make the necessary quick decisions and implement contingency plans as warranted.

9.4 INCIDENT MANAGEMENT

The possibility of a minor incident increases within construction zones. Given that minor incidents can potentially evolve into a major event, an incident management plan is a helpful tool to detect and remove incidents from the highway and restore traffic capacity as quickly and safely as possible. The following information identifies strategies that could be implemented in this project if required to mitigate incidents.

- **Corridor Management Team (COMET):** Program consists of vehicles that regularly patrol major travel routes in the Portland area to keep them free from major obstructions, to provide emergency motorist assistance, and to improve on-scene incident management. Local police departments should be contacted during times of incidents.

- **Traffic Surveillances Stations/Closed Caption Television (CCTV):** ODOT has positioned continuous traffic monitoring surveillance cameras at key locations along all major highways in the Portland metropolitan region that can be accessed via ODOT's website. Furthermore, monitoring loops embedded in roadway pavement provides continuous data that is kept by Portland State University Center for Transportation Studies.

- **Cell Phones:** Mobile cellular telephones should be available at all times to quickly report incidents and emergencies within the project area.

- **Traffic Control Officers/Full-Time Traffic Control Supervisor:** A more rapid response time to incidents is possible when a full-time traffic control officers and a supervisor are on site to make the necessary quick decisions and implement contingency plans as warranted.

- **Variable Message Sign (VMS):** Variable message signs are electronic signs that can display changing message. There are a number of variable message signs located in advance of the project site. VMS should be used to warn drivers of any incidences or traffic delay within the construction area so that they can choose to detour to an alternate route if needed.

- **Towing Vehicles:** Working in tandem with ODOT's COMET described previously, towing vehicles would arrive at the incident scene after an incident management team removes the disabled vehicle or other obstacle.

9.5 DEMAND MANAGEMENT

Temporary Lanes or Shoulder Use: When required, temporary lane-use of roadway shoulders as travel lanes will be limited to the greatest extent possible in areas where lane shifts are necessary.

9.6 ALTERNATE ROUTE STRATEGIES

- **Ramp Closures:** (A) Close the I-5 northbound on-ramp from S.W. Terwilliger Blvd./S.W. Bertha Blvd. Detour traffic to OR99W North. (B) Close I-5 southbound on-ramp from S.W. Hood Avenue (OR43). Detour traffic to OR43, SW Taylors Ferry Road and OR99W South.

- **Signal Timing Adjustments:** Modify signal timings for the signal systems on OR99W. Implement the weekday morning signal timing plan for northbound OR99W and the weekday evening signal timing plan for southbound OR99W on weekends. Some of the signal systems on OR99W within the City of Portland are operated and maintained by the City of Portland. Signal timing adjustments on these signal systems need to be coordinated with the City.

10 INCIDENT MANAGEMENT PLAN

Incident management is a planned and coordinated program that detects and removes incidents from the highway and restores traffic capacity as safely and quickly as possible. Some incident management strategies have already been identified for this project in Section 9.4. Any incident that impacts traffic flow during construction should be coordinated with Region 1 Traffic Management and Operations Center (TMOC).

10.1 EMERGENCY COMMUNICATION PLAN

The Emergency Communication Plan describes how communication will occur and lists important contact information for responding to an incident. Important elements include:

- Goals and objectives of the plan.
- Key contacts and their contact information.
- Emergency and essential services contacts.
- Definitions of emergencies and the appropriate response and communication for each type of emergency.
- Roles and responsibilities of the stakeholders who execute the plan.

Maintaining an updated list of emergency contacts for use in the event of an incident shall be the responsibility of the contractor.

10.2 CONTINGENCY PLAN

A contingency plan should be part of any emergency communication plan that would be implemented when incidents create the need for an emergency detour.

11 MOBILITY COMMUNICATION PLAN

The Construction office will follow the guidelines of this Project Level TMP and the Corridor Level TMP as well as the Project Communication Plan, Mobility Considerations Project Checklist, and MCTD Restriction Notification Form#734-2357. The Contract Special Provisions will contain language requiring the contractor to provide all local emergency agencies advance notification of the project construction start up, lane closures and detour switches. Notify MCTD and Region 1 Mobility Coordinator as required for night time lane and ramp closures on I-5 and any unanticipated vertical or horizontal freight mobility restrictions.